

# PATENT SPECIFICATION

1,043,811



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## COMPLETE SPECIFICATION

### DRAWINGS ATTACHED

#### Seed or Plant Container

I, SAKAE MORI, a Japanese citizen, of No. 604, 5-chome, Kitazawa, Setagaya-ku, Tokyo, Japan, do hereby declare the invention, for which I pray that a Patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to a seed or plant container which is automatic in operation and which requires the minimum of attention.

As methods of cultivating, for example, farm products without using soil there are available, for example, liquid cultivation method, sand cultivation method and pebble cultivation method.

From among these methods, the liquid cultivation method is of almost no practical use for cultivation because the root of a plant enters into the culture solution and thus the flow of air to the roots is hampered so making normal growth difficult to achieve.

In the cases of the sand cultivation and the pebble cultivation, it is necessary to irrigate and to drain the culture solution intermittently into the sand layer or the pebble layer in order to achieve normal growth without hampering the respiratory

activity of the plant root. In order to utilize the sand cultivation or the pebble cultivation in the practical cultivation of farm products so as to achieve normal growth, it is necessary to irrigate and to drain the culture solution several times a day by means of manual or mechanical power thereby necessitating constant personal care or the installation of mechanical equipment for that purpose.

Apart from these methods it would also be possible to feed a culture solution slowly from a culture-solution tank into soil or sand in cultivation pots by utilizing the

[Price]

capillarity of natural or artificial fibres, but this would have the drawbacks of the difference of activity and efficacy subject to the manner of use of fibres, and the properties of the soil or sand, in addition to the necessity of paying frequent attention to the feed of the culture solution in the tank.

Thus, good cultivating result cannot be expected from any one of the aforementioned methods without having a certain amount of special, technical knowledge of cultivation.

According to this invention I provide a seed or plant container comprising a body, an intermediate apertured container part provided with one or more downwardly directed apertured projections, culturing soil being arranged to be contained by the body above the intermediate part, a culturing solution or liquid tank arranged to supply culturing solution or liquid to a space below the intermediate part so as to give a substantially constant level of solution or liquid in the space below the intermediate part and to maintain the level lower than the intermediate part so as to leave an air space, the tank being capable of containing solution or liquid to a level above the intermediate part, the downwardly directed projection or projections being arranged to project into the space for the solution or liquid, and an air port communicating with the air space.

Special cultivating soil (hereinafter referred to as "special soil") is preferably employed in the container and is charged into an inner box of the container as a substitute for, for example, soil or sand. Then the apertured projection or projections of the inner box is or are inserted into the culture solution which is maintained at a substantially fixed level, and in this way the culture solution is fed all over the "special

"soil" by means of the limited capillarity of the "special soil" itself. At the same time an aeration from the lower portion of the "special soil" layer to the mid-layer of 5 "special soil" takes place through small holes or slits in the inner box. By so doing the soil provides good growing conditions for a plant seeded or planted on the "special soil."

10 One constructional embodiment of a seed or plant container exemplifying the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

15 Figure 1 is a longitudinal sectional elevation of the seed or plant container; Figure 2 is a plan view of the container;

Figure 3 is a perspective view of the inner box;

20 Figure 4 is an end view of the inner box; Figure 5 is the end view of the container on the side to which the tank is attached; and

25 Figure 6 is an enlargement of part of Figure 1 showing the relationship of the culture solution and the air intake with the inner box of this invention.

The seed or plant container 1 shown in the drawings which has an inner box 3, is 30 preferably made from a material, such as a synthetic resin, which is resistant to a solution of fertilizer. The container is box-shaped without any opening except for a feeding port 2 for culture solution and air.

35 The inner box 3 has rising sides 4 which contact the sides of the container 1 and projections 5 which raise the box 3 above the base of the container 1 a required distance. The base of the inner box 3 has 40 small holes 6 and/or slits 7, and the projections 5 have slits 14 and/or holes 15.

It is arranged that the lower end of the feeding port 2 is located lower than the bottom surface of the inner box 3; that is 45 to say, as shown in Figure 6, there is a vertical distance B between the bottom of the inner box 3 and the lower end of the port 2.

A culture-solution tank 8 has a single 50 drain opening 9 of about 1.5 cm. in diameter which is inserted into the inside of the container 1 through the port 2 so as to maintain the level of culture solution 11 substantially constant.

55 After the inner box 3 has been inserted into the container 1, "special soil" 10 is put in until the container is filled to nearly its upper brim.

The "special soil" 10 is preferably a 60 homogeneous mixture having large porous grains, the porosity may be obtained by pebbles, such as perlite of two different grain sizes and washed sand, mixed at the ratio of 2:1:1, respectively.

65 The culture solution tank 8 is filled with

a culture solution 11 diluted with water. Then, by holding a finger or the like over the drain opening 9 the culture solution tank 8 is inverted and the drain opening 9 is quickly inserted downwardly into the inside 70 of the container 1 through the port 2.

The arrangement is such that air only enters the culture solution tank 8 through the drain opening 9 when the level of the culture solution 11' is below the level of the 75 drain opening 9, and so further culture solution is only released from the tank when the level of the solution 11' drops below the level of the opening 9.

In this way, as the culture solution 11 80 flows into the bottom of the container 1, it permeates the "special soil" 10, which fills the inside of the inner box 3, through the small holes 15 of about 2 mm. to 3 mm. in diameter or the slits 14 of about 2 mm. in 85 width, and then it is slowly drawn up into the entire layer of the "special soil" 10 by capillary action from a contact surface 12.

Thereafter, the decrease of the culture solution 11' at the bottom of the container 90 1 caused by, for example, its absorption by the plants or evaporation is automatically made good by the aforementioned action.

By providing the inner box 3, aeration to the entire layer of the "special soil" is 95 achieved in cooperation with aeratability of the "special soil" 10, because of the small holes 6 or slits 7 together with a space A of, for example, about 1 cm. between the lower surface of the inner box 3 and the surface 100 of the culture solution 11'.

The sides 4 around the inner box 3 are intended to reinforce the inner box 3 as well as to prevent the cultivating soil 10 from spilling out and covering the portion 105 of the air feeding port 2 from within.

The shape of the projections 5 of the inner box 3 is cylindrical or rectangular, and their size, that is, the total area of contact of the "special soil" 10 with the surface 110 of the culture solution 11 at the bottom of the container 1 is based upon experimental results, since if the "special soil" 10 makes too large a contact with the surface of the culture solution 11', the culture liquid contained in the cultivating soil 10 will become excessive for seeds or planted plants 13.

Besides attaining aeration of the whole of the lower surface of the "special soil" 10 by leaving a horizontal difference B 120 between the lower end of the air intake 2 and the bottom face of the inner box 3, excessive water due to, for example, rain flows out of the container 1 before this excessive water overlaps the bottom of the 125 inner box 3. In this way it is possible to forestall overmoisture and underaeration of the "special soil" 10.

As is described in the foregoing, the present invention is simple in its structure 130

as well as low in its cost, and therefore, this allows the cultivation of vegetables, flowers, and the like purely and automatically without any special, technical cares of manuring and watering, so that this has excellent availability as an automatic seed or plant container to be utilized on verandas of gardenless homes, such as those in apartment buildings.

10 WHAT I CLAIM IS:—

1. A seed or plant container comprising a body, an intermediate apertured container part provided with one or more downwardly directed apertured projections, culturing soil being arranged to be contained by the body above the intermediate part, a culturing solution or liquid tank arranged to supply culturing solution or liquid to a space below the intermediate part so as to give a substantially constant level of solution or liquid in the space below the intermediate part and to maintain the level lower than the intermediate part so as to leave an air space, the tank being capable of containing solution or liquid to a level above the intermediate part, the downwardly directed

projection or projections being arranged to project into the space for the solution or liquid, and an air port communicating with the air space.

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2. A container as claimed in claim 1, in which the intermediate part comprises a box-like container, the base of which is apertured.

3. A container as claimed in claim 1 or 35 claim 2, in which the culture solution or liquid tank has a single outlet, which is arranged to project through the air port, the liquid level in the space below the intermediate part being maintained level with the 40 said single outlet.

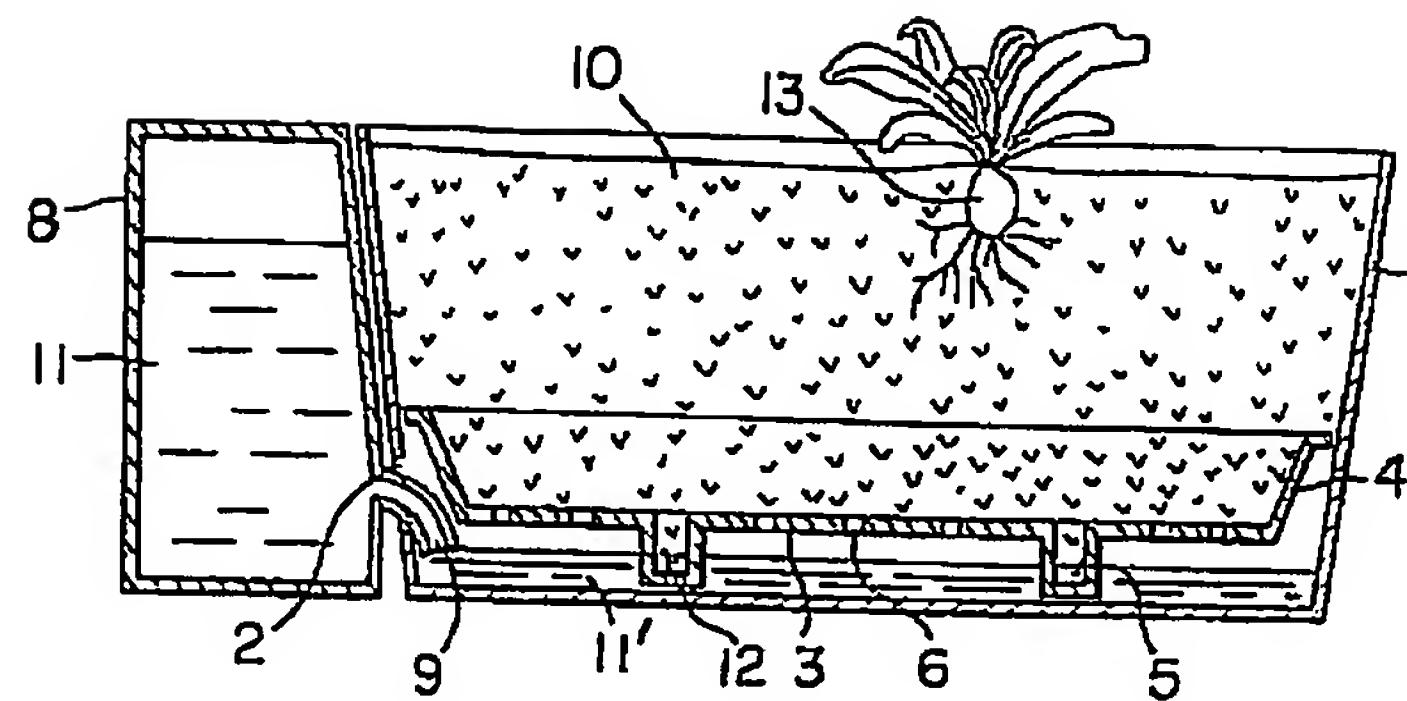
4. A container as claimed in any of claims 1 to 3 made from a material resistant to attack by the culture solution or liquid.

5. A seed or plant container substantially 45 as herein described with reference to the accompanying drawings.

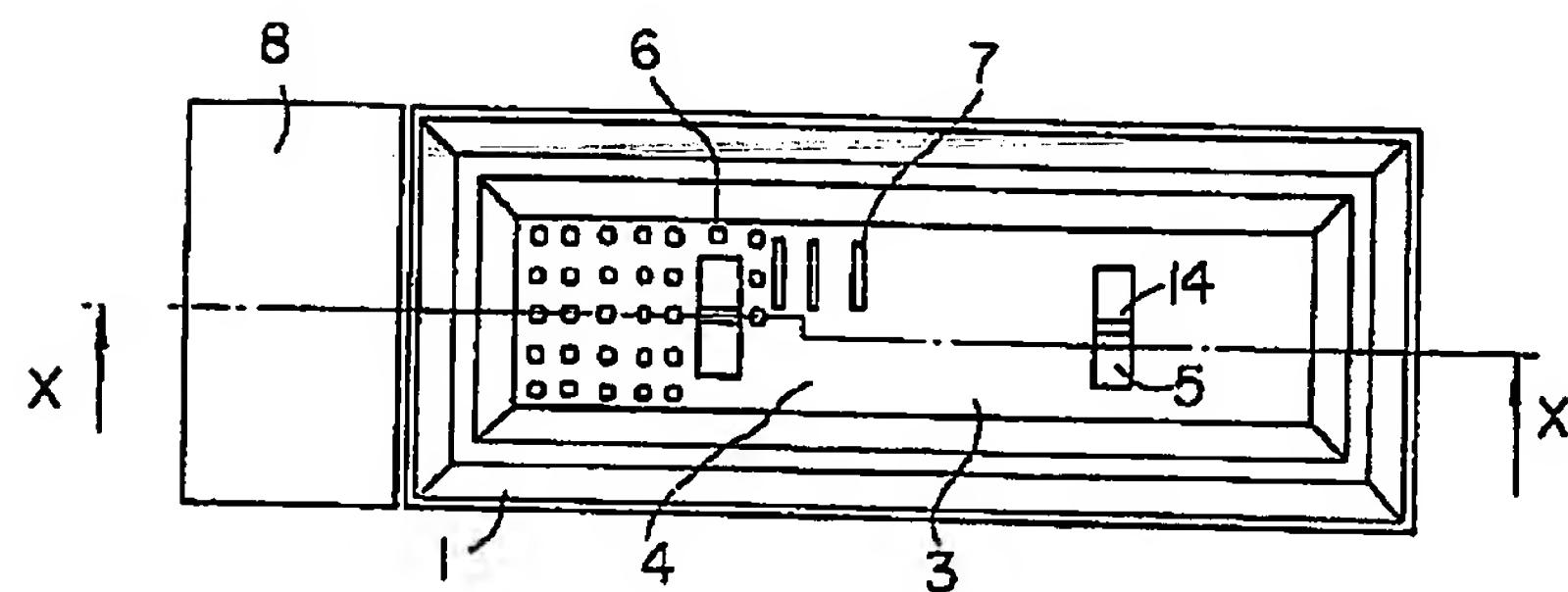
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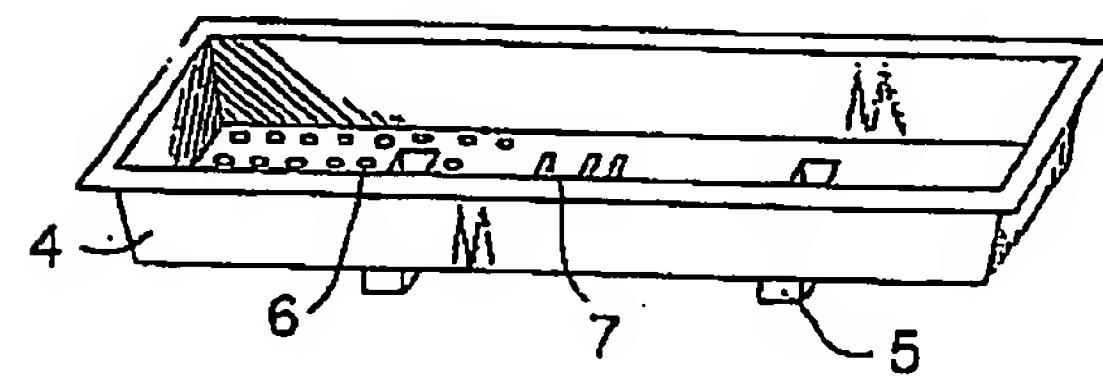
*Fig. 1*



*Fig. 2*



*Fig. 3*



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2 SHEETS

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the Original on a reduced scale.

SHEETS 1 & 2

Fig. 4

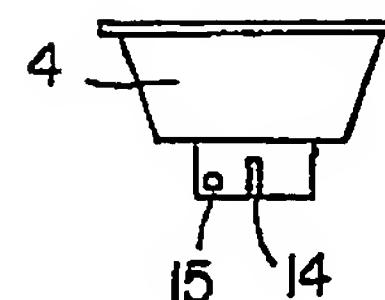


Fig. 5

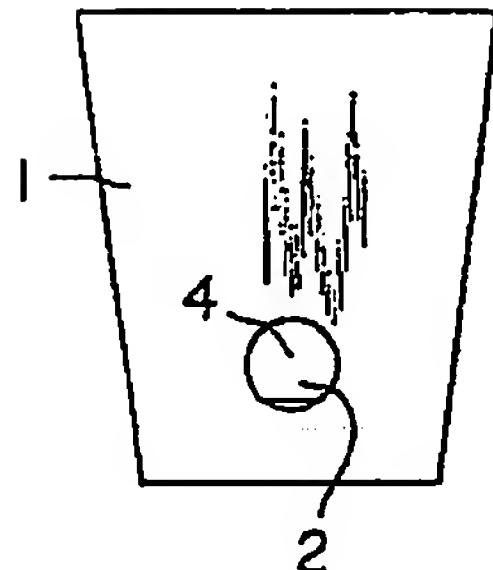
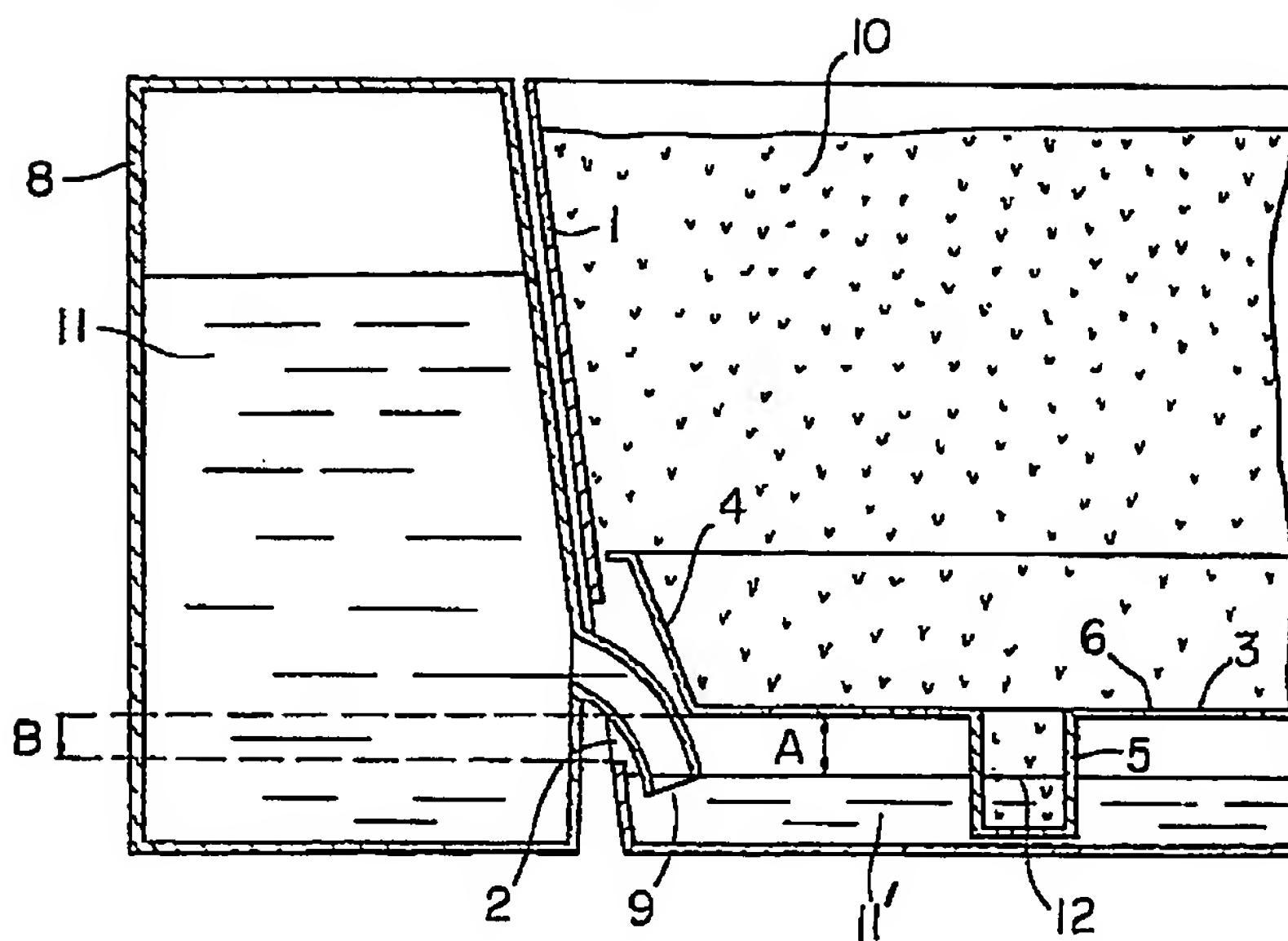


Fig. 6



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SHEETS 1 & 2

Fig. 1

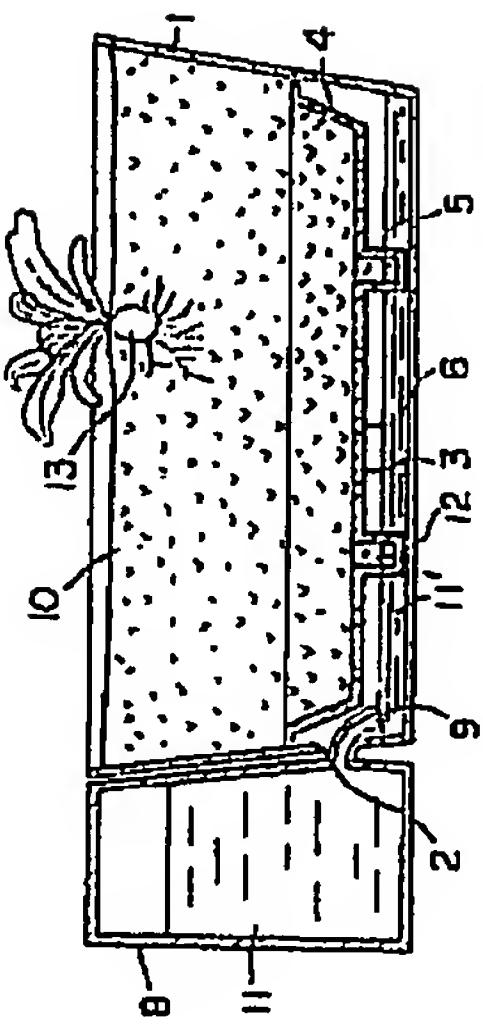


Fig. 2

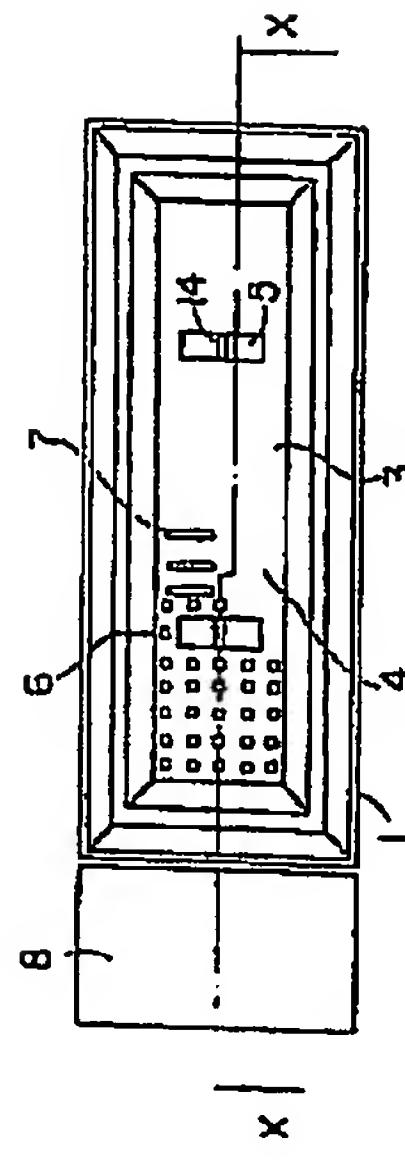


Fig. 3

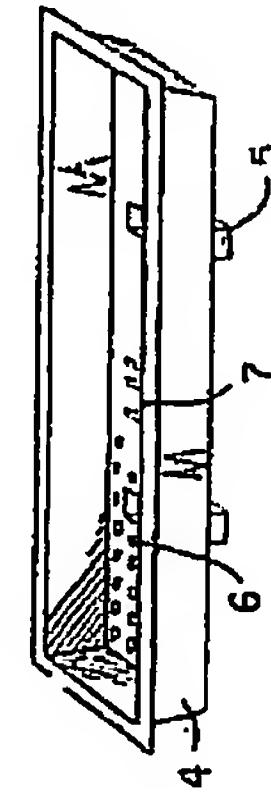


Fig. 4

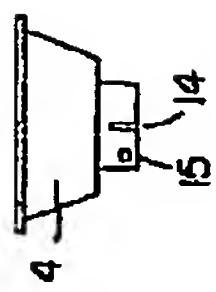


Fig. 5

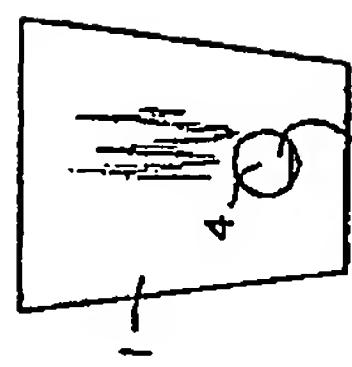


Fig. 6

